AF/1652
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Attorney Docket No.: 4887.204-US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Andersen et al.

Confirmation No: 7632

Serial No.: 09/261,329

Group Art Unit: 1652

Filed: March 3, 1999

Examiner: E. Slobodyansky

For: Cellulase Variants

CERTIFICATE OF MAILING UNDER 37 CFR 1.8(a)

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I hereby certify that the attached correspondence comprising:

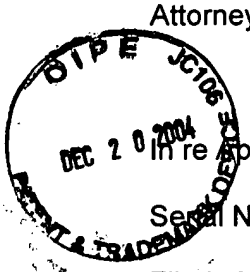
1. Reply Brief (in triplicate)
2. Amendment (in triplicate)

is being deposited with the United States Postal Service as first class mail in an envelope addressed to the address indicated above on December 15, 2004.

Lourdes Ayala
(name of person mailing paper)

Lourdes Ayala
(signature of person mailing paper)

Attorney Docket No.: 4887.204-US PATENT



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REPLY BRIEF

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Alexandria, VA 22313-1450

Sir:

Applicants submit this reply brief to respond a new ground of rejection raised in the Examiner's Answer mailed October 15, 2004. At page 7, third paragraph, the Examiner's Answer states that "Claim 206 is furhter [sic] confusing as reciting positions 21a, 49a, 49b, 95j and 150b."

As discussed in Section V ("Summary of the Invention") of the Appeal Brief, the specification describes at, e.g., page 5, line 39 – page 7, line 12, that the positions recited in the claims are numbered according to the amino acid sequence of the *Humicola insolens* cellulase of SEQ ID NO: 1. In order to identify a corresponding position in another cellulase, e.g., the cellulase of SEQ ID NO: 5, the two amino acid sequences are aligned (see Table 1 at pages 7-11).

The lettering following a position, e.g., 21a, 49a, etc. is explained at page 6, lines 25-32 of the specification states as follows:

> Amino acid residues which represent insertions in relation to the amino acid sequence of the cellulase from *Humicola insolens*, are numbered by the addition of letters in alphabetical order to the preceding cellulase number, such as e.g. position *21aV for the 'inserted' valine (V), where no amino acid residue is present, between lysine at position 21 and alanine at position 22 of the amino acid sequence of the cellulase from *Humicola insolens*, cf. Table 1.

As shown in Table 1, when the cellulase of SEQ ID NO: 1 and the *Ustilago maydis* cellulase (column k of Table 1) are aligned, the *Ustilago maydis* cellulase has two additional amino acids between the positions corresponding to positions 49 and 50 of SEQ ID NO: 1. Thus, these amino acids occupy the positions corresponding to positions 49a and 49b of SEQ ID NO: 1.

Table 1 also provides examples of amino acids occupying positions corresponding to positions 21a, 49a, 49b, 95j and 150b of SEQ ID NO: 1. Based on Applicants' disclosure, one of ordinary skill in the art would understand what is being claimed.

However, in order to reduce the number of issues on appeal, Applicants enclose an amendment deleting the reference to positions 21a, 49a, 49b, 95j and 150b. A copy of the pending claims (i.e., claims 204-206), as amended by the attached amendment, is provided in the attached Appendix.

For the foregoing reasons and the reasons set forth in Applicants' appeal brief, the claims are clear and definite and request that the indefiniteness rejection be reversed.

Respectfully submitted,

Date: December 15, 2004

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APPENDIX

Copy of Claims Involved in the Appeal

204. A modified cellulase, comprising a substitution of the amino acid at position 119 with H in the amino acid sequence of SEQ ID NO: 5, wherein each position is numbered according to the amino acid sequence of the cellulase of SEQ ID NO: 1 and the modified cellulase has endoglucanase activity.

205. The modified cellulase of claim 204, wherein the substitution consists of Q119H.

206. The modified cellulase of claim 204, further comprising
a substitution of the amino acid at position 4 with H, K, M, Q, R, V, or Y;
a substitution of the amino acid at position 5 with S or T;
a substitution of the amino acid at position 6 with T;
a substitution of the amino acid at position 7 with I, K, L, R, or W;
a substitution of the amino acid at position 8 with Y;
a substitution of the amino acid at position 9 with W or Y;
a substitution of the amino acid at position 10 with D;
a substitution of the amino acid at position 12 with G or M;
a substitution of the amino acid at position 13 with K, L, or Q;
a substitution of the amino acid at position 14 with A, P, or T;
a substitution of the amino acid at position 15 with H, S, or T;
a substitution of the amino acid at position 16 with A, C, or M;
a substitution of the amino acid at position 18 with F or Y;
a substitution of the amino acid at position 19 with A, D, E, G, P, S, or T;
a substitution of the amino acid at position 20 with A, E, G, or K;
a substitution of the amino acid at position 21 with K or N;
a substitution of the amino acid at position 42 with D, G, K, N, S, T, W, or Y;
a substitution of the amino acid at position 44 with G, K, P, Q, or V;
a substitution of the amino acid at position 45 with S or T;
a substitution of the amino acid at position 47 with C, G, M, or Q;
a substitution of the amino acid at position 48 with E, N, or S;
a substitution of the amino acid at position 49 with A, G, P, or S;
a substitution of the amino acid at position 74 with A or F;

a substitution of the amino acid at position 82 with E;
a substitution of the amino acid at position 110 with S;
a substitution of the amino acid at position 111 with I, T, or V;
a substitution of the amino acid at position 113 with G or Y;
a substitution of the amino acid at position 114 with N;
a substitution of the amino acid at position 115 with L;
a substitution of the amino acid at position 116 with S;
a substitution of the amino acid at position 121 with D;
a substitution of the amino acid at position 123 with A, M, or Q;
a substitution of the amino acid at position 129 with L or V;
a substitution of the amino acid at position 131 with A or I;
a substitution of the amino acid at position 132 with A, D, P, or T;
a substitution of the amino acid at position 133 with D, K, or N;
a substitution of the amino acid at position 145 with A, D, N, or Q;
a substitution of the amino acid at position 146 with R;
a substitution of the amino acid at position 147 with C, G, K, R, V, or W;
a substitution of the amino acid at position 178 with D, N, or P; or
a substitution of the amino acid at position 179 with N or V.

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For: Cellulase Variants

AMENDMENT UNDER 37 C.F.R. 1.111

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please amend the above-identified application as follows:

AMENDMENTS TO THE CLAIMS:

Claim 206 is amended. The following is the status of the claims of the above-captioned application, as amended.

Claims 1-203 (Canceled).

Claim 204 (Previously presented). A modified cellulase, comprising a substitution of the amino acid at position 119 with H in the amino acid sequence of SEQ ID NO: 5, wherein each position is numbered according to the amino acid sequence of the cellulase of SEQ ID NO: 1 and the modified cellulase has endoglucanase activity.

Claim 205 (Previously presented). The modified cellulase of claim 148, wherein the substitution consists of Q119H.

Claim 206 (Currently amended). The modified cellulase of claim 148, further comprising

a substitution of the amino acid at position 4 with H, K, M, Q, R, V, or Y;
a substitution of the amino acid at position 5 with S or T;
a substitution of the amino acid at position 6 with T;
a substitution of the amino acid at position 7 with I, K, L, R, or W;
a substitution of the amino acid at position 8 with Y;
a substitution of the amino acid at position 9 with W or Y;
a substitution of the amino acid at position 10 with D;
a substitution of the amino acid at position 12 with G or M;
a substitution of the amino acid at position 13 with K, L, or Q;
a substitution of the amino acid at position 14 with A, P, or T;
a substitution of the amino acid at position 15 with H, S, or T;
a substitution of the amino acid at position 16 with A, C, or M;
a substitution of the amino acid at position 18 with F or Y;
a substitution of the amino acid at position 19 with A, D, E, G, P, S, or T;
a substitution of the amino acid at position 20 with A, E, G, or K;
a substitution of the amino acid at position 21 with K or N;
~~a substitution of the amino acid at position 21a with V;~~
a substitution of the amino acid at position 42 with D, G, K, N, S, T, W, or Y;

a substitution of the amino acid at position 44 with G, K, P, Q, or V;

a substitution of the amino acid at position 45 with S or T;

a substitution of the amino acid at position 47 with C, G, M, or Q;

a substitution of the amino acid at position 48 with E, N, or S;

a substitution of the amino acid at position 49 with A, G, P, or S;

~~a substitution of the amino acid at position 49a with C;~~

~~a substitution of the amino acid at position 49b with N;~~

a substitution of the amino acid at position 74 with A or F;

a substitution of the amino acid at position 82 with E;

~~a substitution of the amino acid at position 95j with P;~~

a substitution of the amino acid at position 110 with S;

a substitution of the amino acid at position 111 with I, T, or V;

a substitution of the amino acid at position 113 with G or Y;

a substitution of the amino acid at position 114 with N;

a substitution of the amino acid at position 115 with L;

a substitution of the amino acid at position 116 with S;

a substitution of the amino acid at position 121 with D;

a substitution of the amino acid at position 123 with A, M, or Q;

a substitution of the amino acid at position 129 with L or V;

a substitution of the amino acid at position 131 with A or I;

a substitution of the amino acid at position 132 with A, D, P, or T;

a substitution of the amino acid at position 133 with D, K, or N;

a substitution of the amino acid at position 145 with A, D, N, or Q;

a substitution of the amino acid at position 146 with R;

a substitution of the amino acid at position 147 with C, G, K, R, V, or W;

~~a substitution of the amino acid at position 150b with A;~~

a substitution of the amino acid at position 178 with D, N, or P; or

a substitution of the amino acid at position 179 with N or V.

REMARKS

Claims 204-206 are pending in the present application. Claim 206 has been amended to delete the reference to positions 21a, 49a, 49b, 95j and 150b. Applicants submit that no new matter is added.

The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: December 15, 2004

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